



THE APPLICATION OF 28S *rRNA* DNA BARCODING OF GASTROPOD IN PARI ISLAND, SERIBU ISLAND, INDONESIA

RIZKYAH ZAHRA RANI



**DEPARTMENT OF MARINE SCIENCE AND TECHNOLOGY
FACULTY OF FISHERIES AND MARINE SCIENCE
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BOGOR
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ABSTRACT

RIZKYAH ZAHRA RANI. The Application of 28S *rRNA* DNA Barcoding of Gastropod in Pari Island, Seribu Island, Indonesia. Supervised by BEGINER SUBHAN and NADYA CAKASANA.

Pari Island in the Seribu Islands hosts high marine biodiversity, including ecologically vital gastropods. Morphological identification is often limited by shell variation and species similarity. This study applied an integrative approach combining morphometric analysis and DNA barcoding of the 28S *rRNA* gene to identify gastropod species. A total of 44 samples were collected from four sites in October 2024. Analyses included morphometric measurements (shell length, shell width, spire height, and aperture length) and molecular methods such as DNA extraction, PCR, electrophoresis, sequencing, BLAST, and phylogenetic tree construction using the Kimura 2-parameter model and Neighbor-Joining method. Five species were identified: *Ministrombus variabilis*, *Terebralia sulcata*, *Littoraria intermedia*, *Littoraria scabra*, and *Littoraria pallescens*. All samples were genetically identified with high accuracy. These results confirm the effectiveness of 28S *rRNA* as a molecular marker and highlight the importance of integrating morphological and molecular approaches to assess gastropod biodiversity.

Keywords: 28S *rRNA*, DNA barcoding, gastropod, morphometry, Pari Island

ABSTRAK

RIZKYAH ZAHRA RANI. The Application of 28S *rRNA* DNA Barcoding of Gastropod in Pari Island, Seribu Island, Indonesia. Dibimbing oleh BEGINER SUBHAN dan NADYA CAKASANA.

Pulau Pari di Kepulauan Seribu memiliki keanekaragaman hayati laut tinggi, termasuk gastropoda yang berperan penting secara ekologis. Identifikasi berbasis morfologi sering terkendala variasi bentuk cangkang dan kemiripan antar spesies. Penelitian ini menggabungkan analisis morfometrik dan DNA barcoding gen 28S *rRNA* untuk identifikasi spesies gastropoda. Sebanyak 44 sampel dikoleksi dari empat lokasi di Pulau Pari pada Oktober 2024. Analisis dilakukan melalui pengukuran morfometrik (panjang, lebar cangkang, tinggi spire, dan panjang aperture) serta metode molekuler meliputi ekstraksi DNA, PCR, elektroforesis, sekuensing, BLAST, dan penyusunan pohon filogenetik menggunakan model Kimura 2-parameter dan metode Neighbor-Joining. Lima spesies berhasil diidentifikasi, yaitu *Ministrombus variabilis*, *Terebralia sulcata*, *Littoraria intermedia*, *Littoraria scabra*, dan *Littoraria pallescens*. Semua sampel teridentifikasi secara genetik dengan akurasi tinggi. Hasil ini menegaskan efektivitas gen 28S *rRNA* sebagai penanda molekuler dan pentingnya integrasi morfologi dan molekuler dalam mengungkap biodiversitas gastropoda. Kata kunci: 28S *rRNA*, DNA barcoding, gastropoda, morfometri, Pulau Pari

Kata kunci: 28S *rRNA*, DNA barcoding, gastropoda, morfometri, Pulau Pari



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THE APPLICATION OF 28S *rRNA* DNA BARCODING OF GASTROPOD IN PARI ISLAND, SERIBU ISLAND, INDONESIA

RIZKYAH ZAHRA RANI

Undergraduate thesis submitted to
the Department of Marine Science and Technology
in partial fulfilment of the requirements
for the degree of Bachelor

**DEPARTMENT OF MARINE SCIENCE AND TECHNOLOGY
FACULTY OF FISHERIES AND MARINE SCIENCE
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PREFACE

Praise and gratitude to Allah subhanahu wa ta'ala for all His gifts so that this final thesis is successfully completed. The theme chosen in the final task carried out since October 2024 is about DNA Barcoding with the title of —**The Application of 28S rRNA DNA Barcoding of Gastropod in Pari Island, Seribu Island, Indonesia**— is a requirement to complete the undergraduate program of the Department of Marine Science and Technology, Faculty of Fisheries and Marine Science and Technology, IPB University.

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